

Remarks:

This amendment is submitted in an earnest effort to advance this case to issue without delay.

The priority papers were filed with the original application papers and their receipt was acknowledged in the above-mentioned Examiner's Action. The undersigned hereby reiterates the priority claim made in the earlier-filed Declaration.

The mistake in claim numbering has been corrected by "canceling" never presented claim 5 and correcting the dependencies of claims 6 and 7.

Claim 1 has been amended to clarify that the workpiece is held in the press long enough that its temperature drops below the annealing temperature. A new claim 10 has been added to clarify that the "annealing temperature" is the industry-standard AC₃ temperature.

The main reference cited against this application, US patent 6,003,359 of Futamura discloses a cold deep-drawing operation of the classic type which also anneals the workpiece between succeeding cold-drawing steps to prevent work hardening of the steel. In this system the workpiece is annealed after two cold-forming steps to eliminate work hardening. As described in

column 4 at lines 1 to 12, the still-hot annealed workpiece is deep drawn. There is nothing to suggest the step of "holding the workpiece in the press to harden it." Instead, in Futamura the process is a fast production-line process where the workpiece is moved along at such a pace that, as soon as it is deformed into the desired shape by cold-drawing, it is stepped to the next stage, presumably still at the same temperature it had when entering.

With the instant invention the workpiece is raised to the AC₃ annealing temperature and then deformed in a press, and then held in this press until it is cooler than the annealing temperature. This is in sharp distinction to the Futamura system where there is no suggestion whatsoever to hold the workpiece sufficiently that it cools and hardens as defined in claim 1.

Since Futamura does not disclose holding the workpiece in the final "press" until the workpiece temperature drops below the annealing temperature a §102 rejection on Futamura is impossible. In addition a §103 rejection is impossible since in Futamura the entire purpose of the annealing step is to soften the workpiece, it would not be obvious to change the steps so as to harden the workpiece. Futamura thus does not anticipate the invention and, in fact, teaches away from it.

US 6,457,342 of Tanahashi relates to the forging and heating of aluminum workpieces. This reference recites how the aluminum workpiece is reheated between each of its forming steps. Column 1 at lines 24ff states: "Since the temperature of a work

(sic) made of iron or steel hardly falls, it is enough to heat the work (sic) only once before, whereas the temperature of a work (sic) chiefly made of aluminum easily falls ... and the aluminum ... needs to be heated at the most (to) 400°C." Thus in Tanahashi the entire goal is to keep the aluminum hot at all times. There is no disclosure of pressing a workpiece and holding it until its temperature drops below the AC₃, annealing temperature. In fact this temperature for a steel workpiece, which is the material described in claim 1, is in the neighborhood of 900°C. No holding/cooling step as defined in amended claim 1 is shown or suggested in Tanahashi, so this reference is, at best, cumulative to Futamura.

US 6,550,302 of Ghosh describes selectively heating aluminum, not steel, to improve material flow by selectively warming a die. In our invention the entire workpiece is heated and it is prevented from cooling largely by moving it from stage to stage too fast for it to cool down. As in Tanahashi, the annealing temperature of our invention is about 500° C hotter than in Ghosh. With our invention the last pressing tool is actively cooled. Thus this reference does not add anything to a rejection based on Futamura or Tanahashi.

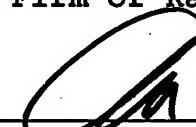
Finally, US 6,613,164 of Dykstra describes a method using an inert gas to actually deform a workpiece. With our invention the inert gas is intended simply to prevent the steel workpiece

from oxidizing while it is at the high annealing temperature. The Dykstra patent has nothing to do with the instant invention.

For these reasons all of the claims of the case are clearly in condition for allowance. Notice to that effect is earnestly solicited.

If only minor problems that could be corrected by means of a telephone conference stand in the way of allowance of this case, the examiner is invited to call the undersigned to make the necessary corrections.

Respectfully submitted,
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Enclosure: None.